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TWELFTH UNITED NATIONS REGIONAL
CARTOGRAPHIC CONFERENCE FOR
ASIA AND THE PACIFIC
Bangkok, 20-28 February 1991
Item 8 (a) of the provisional agenda*

MANAGEMENT OF NATIONAL MAPPING AND CHARTING PROGRAMMES: EDUCATION AND TRAINING

Questionnaire on the availability of training programmes

Paper submitted by the United Nations Secretariat

1. The Eleventh United Nations Regional Cartographic Conference for Asia and the Pacific adopted the following resolutions:

"21. Availability of training programmes

"The Conference,

"Noting that there are a number of countries offering education and training programmes in surveying and mapping, including possible funding to obtain such education and training,

"Further noting that such information may not be available to all member nations, especially those which may need the education and training,

"Recommends that:

"(a) The United Nations should compile this information on the type/kind of education and training available in the different countries, the duration, and the possible funding that may be available to support such studies;

"(b) This information should be disseminated to member countries."

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* E/CONF.83/1.

2. To implement this resolution and provide better service to Member States, the United Nations Secretariat is collecting information on the availability of such programmes. To assist in this effort, you are kindly requested to complete the attached questionnaire or to advise us of the address(es) of the appropriate authorities and/or institutions in your country.

3. The Secretariat hopes the dissemination of this information will help developing countries to establish indigenous capabilities in surveying and mapping and in science and technology.

Annex

QUESTIONNAIRE ON TRAINING PROGRAMMES*

1. INSTITUTION

Name: _____

Address: _____

Telex: _____ Tel: _____

Cable: _____ Fax: _____

Contact person: _____

Principal function(s) of the institution: _____

_____

_____

_____

_____

2. ACADEMIC AND SCIENTIFIC PROGRAMMES

Summary of courses and research activities:

Courses: _____

_____

Research: _____

_____

Duration/frequency/language(s) of instruction: _____

_____

Allocation of time spent in classroom/laboratory/fieldwork/independent research: _____

_____

_____

Facilities: _____

_____

* Please complete the questionnaire in English, French or Spanish. Use additional paper if necessary.

/...

READEX FICHE

Number of trainees: _____

Entry requirements: _____

_____

Degree/diploma/certificate awarded: _____

_____

_____

3. COST OF PROGRAMMES

Cost of tuition, text and related research material: _____

_____

Monthly room and board and incidental expenses: _____

_____

4. SCHOLARSHIP/FELLOWSHIP OPPORTUNITIES

Scholarship/fellowship opportunities for foreign participants: _____

_____

_____

Other financial support available for foreign participants: _____

_____

_____

5. COLLABORATION WITH DEVELOPING COUNTRIES

Specific areas of interest: _____

_____

_____

_____

Geographical preference: _____

_____

_____

_____

Please return to:

Mr. Kadri El Araby
Chief, Infrastructure Branch
Natural Resources and Energy Division
Department of Technical Co-operation for Development
1 UN Plaza, D.C. 1-718
New York, New York 10017

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TWELFTH UNITED NATIONS REGIONAL
CARTOGRAPHIC CONFERENCE FOR
ASIA AND THE PACIFIC
Bangkok, 20-28 February 1991
Item 9 of the provisional agenda*

TECHNICAL ASSISTANCE AND TRANSFER OF TECHNOLOGY

Technical co-operation activities for surveying, mapping, charting and remote sensing in the Department of Technical Co-operation for Development

Paper submitted by the United Nations Secretariat

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* E/CONF.83/1.

90-37315 2028f (E)

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1. OVERVIEW

1. The Infrastructure Branch is part of the Natural Resources and Energy Division (NRED) of the Department of Technical Co-operation for Development (DTCD) and provides technical assistance to developing countries in the planning, construction, maintenance and operation of a large variety of public works. As cartography (surveying and mapping) and remote sensing are vital tools in the planning and operation of infrastructure activities, they are, therefore, included in the functions of the Branch.

2. Assistance in institution building or direct support is provided by means of technical co-operation projects to which both the United Nations and the Government requesting assistance contribute. For its part, the United Nations makes available technical advisory services rendered by international experts, assists in training of local personnel, both in-country and overseas, and provides various items of the equipment needed to meet the objectives of the projects. The Government in most cases contributes, inter alia, in-country facilities, support personnel, as well as provision - in some instances - of national professionals.

3. Upon request for assistance, the Infrastructure Branch provides advisory services through its professional staff, or through highly qualified and specialized consultants engaged for very specific advisory assignments. They undertake short-term preparatory missions to assist Governments in defining their needs for technical assistance, and prepare the necessary reports and project request documents.

4. Currently the Infrastructure Branch is assisting many Governments to meet the need for the maintenance and repair of existing physical infrastructures, and to improve national institutional capability for the management of the systems and the planning of new ones. While at present approximately 80 per cent of the work of the Infrastructure Branch is funded by UNDP, requests for services funded entirely by Governments or by third parties are also being received.

2. SERVICE FUNCTIONS

5. The Infrastructure Branch, NRED assists Governments with planning, development and management of its human and technological resources and related needs, included public services and facilities associated with its physical infrastructure, for economic and social development. The expertise available through the Branch can be summarized as follows:

CARTOGRAPHY	Topographical surveying and mapping, cadastral and hydrographic surveys, urban and utility mapping, thematic cartography.
REMOTE SENSING	Techniques, services, and installation of remote sensing facilities for the exploration of natural resources and infrastructure development.

PUBLIC WORKS — Planning, survey, design, construction, operation, maintenance, repair and restoration of vital public works services and related communication modes, municipal engineering activities, as well as public utilities.

6. These services and expertise are normally made available for the following types of projects:

1. Preparatory assistance projects;

2. Direct support projects with primary functions to provide:

   (a) Development strategies, plans, programmes and projects;

   (b) Substantial technical advice;

   (c) Operational assistance;

   (d) Investment-oriented projects;

   (e) Preparation of specific technical documents;

3. Institution-building projects;

4. Direct training projects with primary functions to provide:

   (a) An ad hoc or short-term group learning effort; (Study tours) and/or,

   (b) Individual fellowships;

5. Experimental projects;

6. Pilot projects;

7. On-the-job training or outside the country.

3. CARTOGRAPHY (MAPPING/SURVEYING AND REMOTE SENSING)

7. Technical co-operation projects in cartography include institution building, transfer of technical expertise to national cartographic and hydrographic institutions and provision of training and equipment. The technical co-operation activities in this field are for the most part aimed at institution-strengthening of national mapping and charting organizations. The strategy applied for all projects is in line with the general development strategy of the United Nations Development Programme which means that emphasis is placed on increased self-reliance of the recipient Government organizations. To achieve this goal, formal and on-the-job training of national personnel at key as well as at operational levels is being recognized as the most important factor, to which all other project actions are generally subordinate.

8. Technical co-operation projects related to cartography are playing an increasingly important role in the economic, social and cultural development of the recipient countries and in the implementation of a vast variety of specialized development projects. If such projects are to be successful, it is first and foremost necessary to achieve an adequate balance between the major elements of which they are composed: expertise for the transfer of technology, on-the-job training and formal training abroad of national counterpart personnel; equipment for training for the transfer of technology and for carrying out production at a minimum and balanced level; and sub-contracts covering elements which are either beyond the present technical capacity of the recipient organization or which are required on an urgent basis.

9. In this context, the high unit costs of certain types of equipment particularly computer-assisted systems, make it increasingly difficult for new projects to achieve a level of balance acceptable to some donors. It is expected that the problems created by the relative dominance of the equipment component will become even more pronounced. The introduction of new and more flexible forms of projects co-funding with investment-oriented donors has so far produced few tangible results, but is nevertheless pursued vigorously.

10. "New dimensional" aspects of technical co-operation are becoming increasingly more manifest in ongoing projects: sub-contractual arrangements with national cartographic institutions have proved to be a viable alternative; long-term assignment of groups of experts to the same project is the exception rather than the rule. On the other hand, short-term consultancies in very specialized fields and the use of highly qualified national professionals in the function of national project co-ordinators is much more visible. This changing aspect of project implementation, however, requires more direct involvement of the executing agency in the monitoring of projects.

11. The level of involvment of UN/DTCD in technical co-operation activities in the Asia and the Pacific region as far as surveying and mapping is concerned, remained at about the same level. Ongoing projects dealing with cartography and remote sensing in the region are presently executed by DTCD in Bhutan, India, Iran, Jordan, Nepal and Viet Nam.

12. The ongoing cartographic projects are generally well on schedule. The lengthy and complex process of nominating national candidates for fellowships abroad - although still a serious problem - appears to be better understood by recipient Governments and has led to a marked improvement of the implementation rate of this project element. Some cases of extensive damage (in transit) to highly sensitive equipment have demonstrated that the elements of <u>force majeure</u> and flexibility must be given their due share in the design of projects.

13. Technical co-operation activities in remote sensing include the preparation of projects and establishment of remote sensing centres on national as well as regional levels. These projects focus on providing technical assistance including fellowships and interpretation equipment with the long-term objectives of enabling developing countries to use up-to-date technology in locating and developing natural and human resources. Assistance in the use of remote sensing for resources

development has also been provided for several countries. As of 1990 about 30 countries have received technical assistance and advisory services which resulted in project designs for further implementation either on a multinational or bilateral assistance level. The range of technical assistance may cover simple processing of remote sensing data to establishing the infrastructure of a fully developed remote sensing centre.

14. The Cartography and Remote Sensing Unit of the Infrastructure Branch DTCD regularly publishes "World Cartography Bulletin" which serves as a communication tool for member countries on novelties in technology, and the Newsletter of the United Nations Group of Experts on Geographical Names (UNGEGN) that serves as a means of finding out not only about the experiences and successes obtained in toponymy but as well about the needs and deficiencies which international co-operation could help fill in.

15. The Cartography and Remote Sensing Unit in NRED also is the liaison focal point of DTCD to the Committee on the Peaceful Uses of Outer Space and is involved in planning and conducting workshops and seminars.

16. In 1990 the Interregional Seminar on Land Information Management in the Development World was formulated by the United Nations Department of Technical Co-operation for Development (UN/DTCD) and subsequently developed in conjunction with the Australian Trade Commission. The aim of the seminar was to highlight the achievements, issues and developments relating to Land Information Management, with a particular reference to the developing world, and to formulate recommendations on future directions and for further action to be taken.

17. The seminar was co-sponsored by the UN/DTCD and the Australian Government. The South Australian Government technology transfer company, SAGRIC International, together with the South Australian Department of Lands, acted as facilitators for the seminar. The seminar was held in Adelaide, South Australia, from 4 to 11 February 1990, at St. Mark's College, a residential college of the University of Adelaide.

18. The UN/DTCD sponsored and arranged for participants from 20 developing countries, which are actively involved in Land Information Systems and Management, to attend and participate in the seminar. A total of 100 people attended the seminar, including experts from industrialized countries, and lecturers from academia.

19. In implementing resolutions from the Eleventh United Nations Cartographic Conference for Asia and the Pacific in January 1987 a Workshop on Training and Transfer of Technology in Digital Cartographic Systems for Digital Mapping was convened at the United Nations Office in Vienna, Austria, from 24 September-2 October 1990 to study the situation and to make appropriate recommendations. The Group assembled at the Vienna International Centre in September 1990 and began with a review of its terms of reference and objectives under the guidance of the elected Chairman, Prof. Fraser Taylor.

20. The target audience for the report to be prepared by the Group was discussed. It was recognized that for the purpose of the technical report, that to distinguish between developed and developing countries in the context of GIS was not appropriate because the distinction is primarily related to the extent of the availability of resources, rather than to any inherent differences in the types of technical and institutional problems that are faced. It was of course recognized that these problems differ considerably in intensity. The Group concluded that the prime target of the report would be the public sector and government agencies that would be attending the Twelfth United Nations Regional Cartographic Conference for Asia and the Pacific in Bangkok in February 1991.

21. In 1989, UN/DTCD convened the Fourth United Nations Regional Cartographic Conference for the Americas in New York, in accordance with Economic and Social Council decision 1985/124. The Conference was attended by 120 representatives or observers of 39 countries, seven specialized agencies and seven intergovernmental and international scientific organizations.

22. Within its mandate DTCD through its Cartographic Unit is planning the following meetings and conferences:

(a) A seminar on receiving and processing of digital satellite data to be held in 1991 in Berlin, Germany;

(b) A training course in toponymy to be held in June/July 1991 in the United Kingdom;

(c) The United Nations Group of Experts on Geographical Names to be held in September 1992 in connection with the Sixth United Nations Conference on Standardization of Geographical Names;

(d) United Nations Seminar during the Congress for the International Society for Photogrammetry and Remote Sensing, September 1992, Washington, D.C.

23. It is to be hoped that the participation of surveying and mapping specialists of Asia and the Pacific region in conferences, seminars and symposia organized under the auspices of the United Nations will remain at the present high level. The Department of Technical Co-operation for Development of the United Nations Secretariat will assist interested organizations and individuals in this respect in every possible way.

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TWELFTH UNITED NATIONS REGIONAL
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ASIA AND THE PACIFIC
Bangkok, 20-28 February 1991
Item 4 of the provisional agenda*

COUNTRY REPORTS ON THE PROGRESS MADE SINCE THE ELEVENTH CONFERENCE

Report on the International Hydrographic Organization

Paper submitted by the International Hydrographic Bureau

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* E/CONF.83/1.

BACKGROUND

The International Hydrographic Bureau (IHB) was founded in 1921. In 1970, an intergovernmental Convention entered into force, changing the IHB's name and legal status and creating the International Hydrographic Organization (IHO) with its secretariat, the IHB, remaining in the Prinicpality of Monaco. The IHO has a consultative and purely technical nature and currently has a membership of 56 Member States (see Table I); it is not a United Nations organization, but works closely with all associated United Nations bodies.

2. The aims of the IHO are:

(a) to coordinate the activities of national hydrographic offices;

(b) to standardize the collection of hydrographic data;

(c) to standardize the symbols, styles and formats used for nautical charts and related publications;

(d) to standardize the training of hydrographic surveyors and nautical cartographers;

(e) to assist developing countries to establish and/or strengthen their hydrographic capabilities;

(f) to assist in the coordination of developments in the handling and formating of digital data and Electronic Chart Display and Information Systems (ECDIS).

3. Official Representatives of Member States meet at five-yearly intervals, in Monaco, to review the progress made by the IHO and to adopt a budget and programmes of work for the next five years. A Directing Committee of three senior hydrographers is elected to guide the work of the total staff of 20 people in the IHB. In between the 5 yearly International Hydrographic Conferences, Regional Hydrographic Commissions meet to discuss common problems and activities; various technical committees and working groups also help to resolve technical, administrative and financial matters.

IMPORTANCE OF HYDROGRAPHY

4. Hydrography is that part of the United Nations' definition of the science of cartography which relates to the measurement and depiction of those parameters necessary to describe the exact nature and configuration of the seabed and the characteristics and dynamics of the sea. These parameters include bathymetry (or depths), tides, currents, waves, physical properties of seawater, geology, geophysics etc.

5. Until the 1950's, the world's major hydrographic offices were able to devote sufficient effort to the collection of data to satisfy the needs of international shipping, then the main customers. Within the last 30 years, there have been many changes including:

a. Increased draughts and changed patterns of shipping, requiring more precise data in previously unexplored sea areas and in the approaches to new or enlarged ports.

b. Improved technology leading to the exploration and exploitation of hydrocarbons and non-renewable marine resources in greater depths and further offshore.

c. The imminent ratification of the United Nations Law of the Sea Convention requiring states to assume responsibility for very large areas of their continental shelves and economic zones.

d. The appreciation of the economic benefits to be obtained from improved methods of fishing, recreational use of the sea and management of national maritime resources.

e. The appreciation of the need to conserve the marine ecology by reducing the risks of pollution following the stranding of vessels on uncharted dangers.

f. The gaining of independence by developing countries left with no hydrographic capacities but with new requirements and responsibilities for collecting data and maintaining nautical charts of their large offshore areas.

ACTIVITIES OF THE IHO

6. The IHO carries out its work mainly by correspondence and by various committees and working groups including:

Chart Standardization Committee (CSC) which, having developed a set of specifications for nautical charts which are now being adopted by all IHO national Hydrographic offices, continues to review the specifications and to review future trends in nautical charting and related information dissemination services. Another significant achievement has been the production, by volunteering hydrographic offices, of two small-scale (1:3.5 M and 1:10 M) International (INT) Charts series covering the world's oceans. Good progress is now being made by IHO Member States with series of

medium and large scale INT charts to cover all the world's major shipping routes and ports.

Committee on ECDIS (COE) has worked with the International Maritime Organization IMO/IHO Harmonizing Group on ECDIS to produce Provisional Performance Standards for ECDIS for the guidance of manufacturers of ECDIS; COE's work continues through six working groups examining and developing specific aspects of the Provisional Standards.

Committee on the Exchange of Digital Data (CEDD) works closely with the COE to develop standards for the exchange of digital data in terms of the format to be used and object and attribute coding.

Training - Together with the International Federation of Surveyors (FIG), a joint FIG/IHO International Advisory Board on Standards of Competence for Hydrographic Surveyors has published a set of standards for the training of various categories of hydrographic surveyors for the guidance of academic establishments throughout the world. The board meets annually to review courses submitted to it, which are evaluated against the standards and awarded certificates of recognition when appropriate. The IHO is now studying the standardization of training in nautical cartography. The IHO publishes a compendium giving information on courses available on hydrographic surveying and nautical cartography (SP-47).

Ocean Bathymetry - To contribute towards the scientific knowledge of the oceans, volunteering IHO hydrographic offices maintain a World Series of 1:1 M Bathymetric Plotting Sheets which are used to produce the General Bathymetric Charts of the Oceans (GEBCO) under the supervision of a joint IOC/IHO Guiding Committee for GEBCO. The Guiding Committee has sub-committees on Geographical Names and Nomenclature of Ocean Bottom Features and on Digital Bathymetry. The IHO also works closely with the Editorial Boards for larger scale International Bathymetric Charts and Overlay Sheets for various maritime areas and has recently established an IHO Data Centre for Digital Bathymetry at the US National Geophysical Data Center (NGDC) of Boulder, Colorado, USA.

Tidal Constituents - Tidal data is used in various aspects of navigation and the measurement and prediction of tides is a fundamental element of hydrography. To assist in this work, a Tidal Constituent Bank has been established in Canada by the IHO. Tidal data has assumed great importance in recent series as a parameter in the prediction of the effects of global warning.

Technical Assistance - recognising the very inadequate data available in many parts of the world and the lack of any hydrographic capability in many developing countries, the IHO has allocated limited funds to enable it to send experts to any country - whether an IHO Member State or not - which requests such visits. During such a visit, the IHO expert will visit all the various national organizations with marine responsibilities to discuss the present situation, the benefits to be derived from establishing a hydrographic capability and the procedures to be adopted in order to prepare a Project Formulation Framework and a draft UNDP Project Document and on how to obtain UNDP or bilateral assistance. In 1990, an IHO expert

has visited the Kingdom of Tonga, Republic of Seychelles and Pakistan in the Asia and Pacific Region.

Publications - In addition to the semi-annual International Hydrographic Review and the monthly International Hydrographic Bulletin, the IHB produces a series of special publications, each in the two officials languages of the IHO - English and French. A Catalogue of IHO Publication is available (free) from the International Hydrographic Bureau, BP 445, MC 98011, Monaco. Details of some of the available IHO Publications are in Table II.

MEMBERSHIP OF THE IHO

7. A Government visiting to become a member of the IHO should apply for accession to the intergovernmental Convention on the IHO through diplomatic channels to the Government of the Principality of Monaco, the Depository Government for the Convention, indicating the tonnage of the country's registered fleets. This figure is obtained by adding 6/7 ths of the displacement tonnage of ships of war exceeding 100 tons to the gross tonnage of all their other vessels over 100 tons. When two-thirds of the existing IHO Member States have signified, to the Government of Monaco, their approval of the application, the acceeding Government will be asked to deposit an instrument of accession with the Government of Monaco.

8. Annual contributions to the IHO are based upon the reported shipping tonnages and vary between a basic 2 and a maximum of 27 shares. In 1991, the value of each share is 1852.48 SDRs (Special Drawing Right units of the Instructional Monetary Fund) or about 2,500 US dollars.

TABLE I

LIST OF IHO MEMBER STATES - NOVEMBER 1990

Argentina
Australia
Belgium
Brazil
Canada
Chile
China
Cuba
D.P.R. Korea
Denmark
*Dominican Republic
Ecuador
Egypt
Fiji
Finland
France
Germany
Greece
Guatemala
Iceland
India
Indonesia
Iran
Italy
Japan
Malaysia
Monaco
Netherlands
New Zealand
Nigeria
Norway
Oman
Pakistan
Papua New Guinea
Peru
Philippines
Poland
Portugal
Republic of Korea
Republic of South Africa
Singapore
Spain
Sri Lanka
Suriname
Sweden
Syrian Arab Republic
Thailand
Trinidad and Tobago
Turkey
U.S.S.R.
U.K.
U.S.A.
Uruguay
Venezuela
Yugoslavia
*Zaire

* All rights and benefits suspended due to non payment of contributions

Applications pending - Cyprus, Mauritania, United Arab Emirates.

TABLE II

SELECTED LIST OF IHO PUBLICATIONS

PP-05	IHO Yearbook
MP-001	Basic Documents of IHO
MP-004	Chart Specifications of the IHO
MP-005	Standards of Competence for Hydrographic Surveyors
MP-006	Reference Texts for Training of Hydrographic Surveyors
SP-32	Hydrographic Dictionary
SP-44	IHO Standards for Hydrograhic Surveys
SP-47	Training Courses in Hydroraphy
SP-50	IHO Tidal Constituent Bank Station Catalogue
SP-51	Manual on Technical Aspects of the Law of the Sea
SP-52	Provisional Standards for ECDIS
SP-55	Status of Hydrographic Surveying Worldwide
BP-0008	Gazetteer of Geographical Names of Undersea Features

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TWELFTH UNITED NATIONS REGIONAL
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Bangkok, 20-28 February 1991
Item 5 (d) of the provisional agenda*

CARTOGRAPHIC DATA ACQUISITION AND SUPPORTING ACTIVITIES: HYDROGRAPHIC SURVEYING AND NAUTICAL CHARTING

Status of hydrographic surveying and nautical charting in Asia and the Pacific

Paper submitted by the International Hydrographic Bureau

* E/CONF.83/1.

90-37049 2176j (E)

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INTRODUCTION - BACKGROUND

1. The UN recognizes the International Hydrographic Organization (IHO) as the one focal point and source of authority on matters associated with international and world hydrography. The IHO was solicited as a consultant and advisor when the first comprehensive report on the Status of Hydrography Worldwide was made and presented to the 6th UN Regional Cartographic Conference for Asia and the Far East, in Teheran 1970. Since that time, the IHO has been asked on several occasions to prepare similar reports, of which the most recent one has been under preparation during the last two years, to be printed and distributed in early 1991 as IHO publication SP-55. A preliminary version of the report was presented to the 4th UN Regional Cartographic Conference for the Americas 1989.

2. The most obvious conclusion that stems from this recent study is that, despite earlier recommendations made in the previous reports, there has been little significant improvement in the status of the developing coastal states, where the lack of adequate surveys and nautical charts is seen as seriously retarding their socio-economic progress as has been described in the report of the IHO's activities under Agenda item 4.

3. The following is a resume of conclusions in SP-55, with special regard to its findings concerning Asia and the Pacific. It should be underlined that some of the figures are based on a limited sampling.

FINDINGS

General

4. The situation concerning the status of hydrographic surveying in Asia and the Pacific differs in general not significantly from the figures worldwide. The overall status of Hydrographic Surveying and Nautical Charting is probably somewhere in the range of from "poor" to "fair". Major maritime nations are in the "satisfactory" range level of hydrographic adequacy, but it is the developing nations that are being adversely handicapped by the lack of adequate data and charts. Hydrographic capability is poor or totally lacking in a large majority of developing countries. This is a clear statement of the problem that confronts international hydrography and the United Nations.

5. The ability of developing coastal states to improve their economy is highly dependantupon marine commerce. Adequate hydrographic surveys and nautical charts that permit the safe transit of ships to and from ports are one of the basic requirements for economic development. Whilst no significant increases in the overall size or draught of world shipping are envisaged, developing countries particularly may need to prepare to cater for deeper draught vessels than previously handled, if port facilities are improved.

6. The International Maritime Organization (IMO) accepts responsibility for the regulation of Maritime Shipping Routes in order to improve safety of navigation. The IMO recommends the adoption of national Traffic Separation Schemes (TSS) and Deep Water Routes (DWR), requiring that these waters are adequately surveyed and charted before they are brought into force. World maritime states without a hydrographic capability are therefore prevented from submitting TSS and DWR, in order to protect their coasts from possible marine pollution, unless they can provide evidence of their waters having been adequately surveyed. Economic pressures have forced shipping companies to accept much lower underkeel clearances in recent years and underkeel clearances of less than five meters are not uncommonly accepted.

7. Hydrographic data and charts are also prerequisites for the exploitation and management of maritime resources and for the exercise of the exclusive rights to vast sea areas which coastal states are granted through a series of the UN Law of the Sea Conferences. A great number of states have still to delineate the extent of their Exclusive Economic Zone and their Continental Shelf. The present definition of the juridical Continental Shelf is highly complex and will require detailed bathymetric and geophysical surveys in order to delineate its outer limits, when these ectend beyond 200 nautical miles from the baselines.

Surveying and charting capability assessment

8. Approximately 32% of the world maritime states have no national hydrographic capability. Approximately 40% have some capability, but only about 28% fall into the category of having adequate to fully developed capabilities. The corresponding figures for the 52 coastal states of Asia and the pacific shows that 17 states (33%) have no national capabilities, 19 states (36%) are in the group of having some capabilities, whilst 16 states (31%) have reasonably adequate to fully developed capabilities. The study identifies that the 35 coastal states of the Asian region in all dispose 124 ships and 106 boats designated for hydrographic surveys, with only 9 ships and 16 boats shared between the 17 maritime nations in the Pacific region.

9. A total of 50 coastal nations worldwide were (in December 1988) assigned the lowest surveying and charting capability. Seven of these are in the Asian region:

- Brunei
- Iraq
- Jordan

- Maldives
- Qatar (small survey unit now operational)
- United Arab Emirates
- Yemen

ten states are in the Pacific region:

- Fed. States Micronesia
- Kiribati
- Northern Mariana Island
- Papua New Guinea (relies on cooperative plan with Australia)
- Rep. of Marshall Islands
- Rep. of Palau
- Samoa
- Tonga (action now started to form a capability)
- Tuvalu

These nations should be given priority when international organizations and other countries are considering development programmes or other kind of assistance.

10. In addition to these nations, there are 11 states in Asia and 2 states in the Pacific which were assigned the next lowest rating. These states should also be considered as prime candidates for hydrographic support:

In the Asian region:
- Bahrain (survey unit now operational)
- Bangladesh
- Democratic Kampuchea
- Islamic Republic of Iran (some work completed by contract)
- Kuwait
- Lebanon
- Oman (survey unit now being formed)
- Saudi Arabia (contract surveys completed)
- Sri Lanka
- Syrian Arab Republic
- Viet Nam

In the Pacific region:
- Solomon Islands (survey unit now operational)
- Vanuatu (survey unit being formed)

Surveying and charting assessment

11. Of the 97 million square kilometres worldwide studied by the report*), only 29% is considered adequately surveyed, 22% requires resurveying and 49% is classified as inadequately or not surveyed. The corresponding

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* Square kiometres estimates were available only for approximately 81% of the worlds maritime Exclusive Economic Zones.

figures for the Asian region indicate that 30% is adequately surveyed, 34% needs resurveys, and 36% is considered inadequately or not surveyed. For the Pacific region, only 17% is considered adequately surveyed, whilst 11% needs to be resurveyed and as much as 72% is considered inadequately or not surveyed.

12. Whilst the figures above indicate a regional status for Asia much in the line with those for the overall status worldwide, it should be noted that the South Central/West pacific is listed as one of three large major regions of hydrographic deficiency. Three of the 8 world maritime areas assessed as having the most inadequate nautical charts are found in the Asian region:

1. Jordan
2. Paracel Islands
3. Spratly Islands

Furthermore, seven of a total of then specific areas worldwide identified to the IHB by non-governmental maritime organizations as requiring larger scale charts or more detailed surveys than are currently available, belong to Asia and the Pacific:

1. Gulf of Oman
2. Northern Arabian Gulf (excluding Kuwait and Kharg Island)
3. Strait of Bab el Mandeb
4. South China Sea
5. Gulf of Papua
6. One Fathom Bank (Malacca Strait)
7. Java Sea (selected areas)

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Bangkok, 20-28 February 1991
Item 6 (d) of the provisional agenda*

CARTOGRAPHIC DATA RECORDING, COMPILATION AND MANIPULATION: NAVIGATIONAL AND BATHYMETRIC CHARTING

Status of International (INT) Charts

Paper submitted by the International Hydrographic Bureau

* E/CONF.83/1.

90-37057 2035h (E)

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I. THE INT CHART CONCEPT

The International Hydrographic Organization was formed as the result of a desire for greater standardization of nautical charts and associated publications and consequently for greater safety for mariners. It was felt that this Standardization could be achieved in such a way that language differences would be minimized and that a chart produced by one country would be perfectly comprehensible to a navigator from another country.

2. Although measures have been taken since the formation of the International Hydrographic Bureau (IHB) in 1921 to develop standards to be followed nationally when producing charts and publications, it was not until 1967 that the concept of an INTernational chart was proposed. It was felt that, instead of several different Hydrographic Offices each producing different charts of the same ocean area, often with differing data, scales and limits, it would be both more economic and safer if one Hydrographic Office would compile and produce an original chart, to internationally agreed specifications, and that other Hydrographic Offices would be able to print the chart, using the basic reproductive material provided by the original producer nation but substituting their own language, if they wished.

3. The first step was to agree on the standardization of the format and symbols to be used on international charts. The 1967 International Hydrographic Conference established a Commission which, working by correspondence, developed the "Chart Specifications of the IHO" which were adopted at the 1982 International Hydrographic Conference. These Specifications are published as IHO Publication MP-004, of which a new edition, composed of six sections, was published in 1989/90. These Specifications are applicable to all INT Charts and recommended also for all national chart series.

4. It was also necessary to develop an agreed scheme, at agreed scales, to provide world-wide coverage. A system of two series of small scale charts at scales of 1:10 million (19 charts) and 1:3.5 million (60 charts) was agreed. The two series were published during a 15 year period starting in 1972. This provided international shipping with uniform modern chart coverage for all ocean passages.

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5. In 1982, the success of the small-scale INT Chart Series led to consideration of extending the concept to include charts at medium and large scales. Following the International Hydrographic Conference of that year, the North Sea Hydrographic Commission began to assess the problem by making a pilot study of the North Sea. Once again the Member States involved had to agree to a chart scheme that would satisfy the needs of international shipping for that area. It was agreed that this would include medium scale charts of coastal and sea areas at scales between 1:150,000 and 1:1.5 million, and approach and harbour charts at scales greater than 1:150,000. Agreement had been reached that the maximum paper size should be defined as being AO (1189 x 841 mm).

6. Following the study of INT Charts at medium and large scales for the North Sea, Regional Chart Commissions were established for all of the other regions around the world. Their task is to develop Chart Schemes for their regions, leading eventually to a total world coverage of INT Charts at medium and large scales for all of the world's main shipping routes, ports and port approaches.

7. This coverage may be complemented by large scale national charts for navigation by mariners requiring a more detailed knowledge of a country's waters. As of November 1990, 211 INT Charts at medium and large scales had been published, primarily of the waters of north-west Europe.

8. While emphasis has been given to the production of charts, it has been realized that there may be some benefit in having all hydrographic publications, such as Sailing Directions, Light Lists and Tide Tables, standardized. Several studies have been undertaken but it has been shown that, due to language differences and particular national requirements, such standardization is impractical except in term of Standardizing the lay-out and overall presentation of these complementary publications.

9. At present, nationally produced charts and other publications are maintained up to date by a system of national Notices to Mariners, and even though the INT Charts form part of an international folio, they are maintained up to date by the producer nation. As the INT Chart becomes a more truly international series, it is conceivable that a complementary set of international Notices to Mariners may be developed.

II. STATUS OF INT CHARTS AT MEDIUM AND LARGE SCALES IN THE ASIA AREA

10. As stated above, the International Hydrographic Conference decided, in 1982, to develop a world wide coverage of International (INT) charts at medium and large scales.

11. The work was carried out on the initiative of the IHB, in consultation with the IHO Member States. The first step consisted of forming Regional Working Groups for the production of large and medium scale INT charts. Starting points were:

- the existing national charting schemes;
- the World Wide Navigational Warning Service (WWNWS);
- the existing Regional Hydrographic Commissions (e.g. the East Asia Hydrographic Commission, EAHC);
- the small scale INT chart series at scale 1:3.5M.

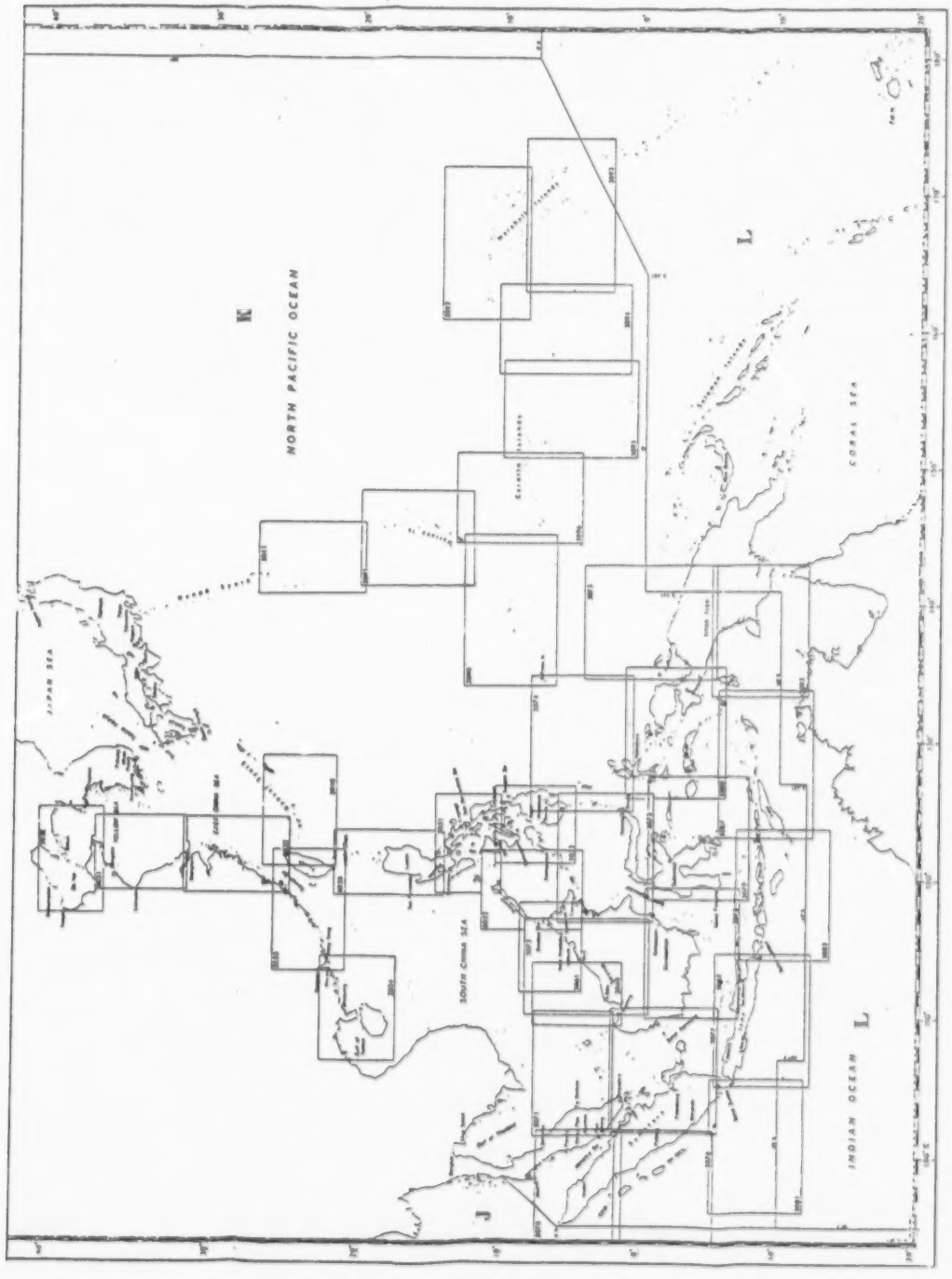
12. The formation of 12 Regional Charting areas was achieved in 1986, numbered from A to L. The Asia and Pacific area is covered by Regions J, K and L. Since 1986, INT chart schemes have been developed within each region under the chairmanship of a Coordinator country: India for Region J, Japan for Region K and Australia for Region L.

13. Countries involved in the preparation of each scheme include IHO Member States of the Region, other IHO Member States who publish charts in the Region, and non-Member States of the Region who have a genuine interest in nautical charting.

14. Schemes for Regions J and L are almost agreed and the scheme for Region K was accepted in October 1990. In addition to Japan, the following countries participated in the work: China P.R., Indonesia, Malaysia, Philippines, Thailand, Singapore, Republic of Korea, Australia, France, Federal Republic of Germany, UK, Portugal, USSR and USA. The final Region K INT Chart Scheme at medium scales 1:1,000,000 - 1:510,000 is attached as Annex I.

ANNEX I

INT CHART SCHEME AT MEDIUM SCALES FOR THE REGION K
(Coordinator : Japan)



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Item 7 (b) of the provisional agenda*

CARTOGRAPHIC DATA RETRIEVAL, ANALYSIS, DEPICTION, PRESENTATION AND PRODUCT GENERATION: DIGITAL DATA BASES

IHO Data Centre for Digital Bathymetry

Paper submitted by the International Hydrographic Bureau

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* E/CONF.83/1.

90-37064 2071e (E)

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The General Bathymetric Chart of the Oceans (GEBCO) traces its origins back to the early 20th century, when Prince Albert Ist of Monaco offered to organize and finance the production of a world wide bathymetric chart series, at scale 1:10M. Several editions have been issued since the first was completed in 1903; the last one (5th) was completed in 1982.

Bathymetric data was collated on plotting sheets at scale 1:1M, by the International Hydrographic Bureau (IHB) at Monaco from 1930 until 1965, when the task was shared between a number of IHO Volunteering Hydrographic Offices (VHOs), which are still responsible for recording all available oceanic soundings.

These bathymetric plotting sheets now form a unique data base, upon which most ocean bathymetric charts rely heavily. Copies of these plotting sheets are available for purchase from the VHOs concerned. Allocation of the plotting sheets among the VHOs is indicated in the IOC-IHO publication BP-0002 "GEBCO Catalogue of Bathymetric Plotting Sheets". For the Indian and West Pacific Oceans areas, the VHOs concerned are India, Indonesia, Japan, Philippines, New Zealand and Australia.

In 1984, at a meeting of the IOC-IHO Sub-Committee on Digital Bathymetry, the need to set up an International Data Centre for Digital Bathymetry, whilst still maintaining the existing VHO network, was emphasized, in view of the problems of managing the increased flow of digital data between more numerous customers including the geoscientific community.

Consequently, at a meeting of the Joint IOC/IHO GEBCO Officers, in 1986, the National Oceanic and Atmospheric Administration (NOAA) of the USA, with considerable experience in handling marine geological and geophysical digital data at its National Geophysical Data Center (NGDC) at Boulder, Colorado, volunteered to establish within the NGDC, an IHO Data Centre for Digital Bathymetry. This proposal was also discused at the 1987 International Hydrographic Conference, which decided to forward it to the IHB for further clarification.

The NOAA/NGDC proposal was discussed and finalized by correspondence between the IHO Member States and an agreement was eventually reached in 1990 between all the parties. The IHO Data Centre for Digital Bathymetry was established on 1st June 1990. The Terms of Reference of the Centre are attached as Annex I. The Operational Procedures, Systems and Formats,

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supporting the banking of Bathymetric Data at the Centre, have yet to be established by the NGDC.

In order to be successful, it is important that all echo-sounding data collected by all the surveying or research vessels operated by national and commercial organizations should be forwarded to the IHO Data Centre for Digital Bathymetry, either directly to the NGDC, Boulder, or via the VHO's. It is also desirable that bathymetric data should be collected as a matter of routine during all oceanographic cruises.

It should be noted that provision of digital bathymetric data to all IHO Member States is free of charge (paragraph 2 of Annex I), regardless of the amount of data which they may have individually contributed, providing their request is made through the IHB. Other potential customers may order data directly from the NGDC whose address is given in Annex I.

For information, the total number of individual soundings (greater than 100 metres) in the data bank now exceeded the 20 million.

ANNEX I

SERVICES TO BE PROVIDED BY THE IHO DATA CENTRE FOR DIGITAL BATHYMETRY

National Geophysical Data Center
NOAA E/GC3
325 Broadway
Boulder, Colorado 80303 - 3328
U.S.A.

Teleph : +1 (303) 497 - 6338
Fax : +1 (303) 497 - 6513
Telex : 592811 NOAA MASC BDR

Services to be provided by the US National Geophysical Data Center (NGDC) on behalf of the IHO will include, but not be limited to:

(1) Operation of the data center with a focus of activity on oceanic regions with depths greater than 100 metres.

(2) Provision free of charge, to the IHO for use by its Member States, the data needed for their national or international projects. The IHO Member States will submit their requests for data through the International Hydrographic Bureau (IHB). IHO Member States' Hydrographic Offices (HOs) will provide the center with the digital bathymetric data collected by their nation's institutions in oceanic regions.

(3) Maintenance of a quality control facility whereby data provided to the center are at least subjected to simple checks for violation of physical principles (instantaneous changes in position, impossibly high ship speeds, etc.) and completeness of labeling, referring detected obvious errors back to suppliers of data for possible corrections. Member States' Hydrographic Offices may be requested to assist in resolving matters of quality control concerning data originated by their nation's organizations.

(4) Maintenance of inventories in digital form of all digital bathymetric data, including digital contour data, and the production of an annually updated catalog of recently acquired bathymetric data. The center will provide this catalog to the IHB in a form analogous to the present IHO publication BP-0004.

(5) Maintenance of trackline catalogs of newly collected data to be provided upon the request of an IHO Volunteering Hydrographic Office (VHO) for its area of GEBCO responsibility.

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(6) Collaboration with various international organizations in the development of exchange formats and standards to expedite bathymetric data exchange, including digital bathymetric contours.

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Item 8 (a) of the provisional agenda*

MANAGEMENT OF NATIONAL MAPPING AND CHARTING PROGRAMMES: EDUCATION AND TRAINING

FIG/IHO International Advisory Board on Standards of Competence for Hydrographic Surveyors

Paper submitted by the International Hydrographic Bureau

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* E/CONF.83/1.

1. The International Hydrographic Organization believes that education and training provide the most essential and long lasting contribution that can be made in the way of technical assistance.

2. A fundamental objective of the International Hydrographic Organization (IHO) is to set standards for the conduct of hydrography and the hydrographic products of its Member States. It is therefore clear that Standards should be set for the qualifications of those who practise the profession. A second objective is to tender guidance and advice upon request, in particular, to countries engaged in setting up or expanding their hydrographic service.

3. With the above objectives in mind, the IHO and the Fédération Internationale des Géomètres (FIG) came together in 1972 and decided that some form of international accreditation for hydrographic surveyors was desirable. FIG was concerned with the need for commercial firms working in the offshore industry, to have some recognized certification of the quality of staff which they might employ. IHO was working towards the objectives stated above and was particularly concerned with providing advice to developing nations interested in acquiring a capability in hydrographic surveying.

4. A jointly sponsored working group was set up, which later led to the formation of an International Advisory Board. A standard Syllabus and recommended levels of experience were established. To date, only individual teaching establishments have been accredited, but the Board is now preparing a document which may provide general directions to allow national accreditation for individuals, based on the international Standards.

5. Courses submitted by educational organizations through National Focal Points are submitted to the International Advisory Board, which meets each year. These courses are compared against the Standards of Competence for Hydrographic Surveyors. Courses of study, at least meeting the requirements, are accredited as either Category A or B as either Full or Academic. These terms are explained within the Standards.

6. The Standards of Competence are produced in two volumes MP-005 "Standards of Competence for Hydrographic Surveyors" and MP-006 "Reference Texts for Training of Hydrographic Surveyors", both published by the International Hydrographic Bureau on behalf of the parent organizations. MP-005 includes a preamble and a detailed syllabus. The Standards are a "minimum" level. MP-006 provides a Bibliography of publications of direct relevance to hydrography and its associated sciences.

7. The Standards are reviewed by the Board at its annual meetings. The Fifth Edition of MP-005 was published in English, French and Spanish in 1987, and in Portuguese in 1989. At its 1987 meeting a significant change was made to make the Standards more applicable to commercial surveying. There is now a syllabus with a core of common courses and three specialisms : (1) Nautical Charting ; (2) Port and Nearshore Surveys ; (3) Industrial Offshore Surveying. To secure accreditation a course must include the core and at least one of the specialisms. MP-006 is at present being reviewed for republication early in 1991.

8. The International Advisory Board is composed of eight members, four appointed by the IHO and four appointed by FIG. The Chairman and Vice Chairman are elected by the members, alternately from the FIG and IHO members. The term of service is three years, after which the Vice Chairman assumes the office of Chairman.

9. Up to the present time, 23 courses have been accredited. In Asia and Australasia this includes the Graduate Diploma Course of the Australian Maritime College, Tasmania, the Basic/Long Hydrographic Specialist Course(s) of the Indian Naval Hydrographic School at Goa and the Group Training Course in Hydrographic Surveying and the Advanced Course in Hydrography in Japan.

10. In addition, students from Asia and the Pacific are accepted at many of those courses outside the Region, details of which are included in the full list of the courses available in Hydrography and Nautical Cartography, as listed in the IHB Special Publication No. 47, 3rd Edition 1988.

11. A new course, that is particularly relevant to the needs of developing coastal States, is the IMO Model Course on Hydrography, which is scheduled to be presented for the first time starting in March 1991 at the Trieste Maritime Academy, Italy. This course is being funded by the Italian governement and places are being offered free of charge for 12 students in 1991. Action is being taken at present to develop standards similar, to those developed for Hydrographers, for Nautical Cartographers. Once again, these are expected to be minimum standards but will provide both a standard with which to compare existing courses and a model on which to plan new courses.

12. Attached to this paper, as Annex 1, is a complete List of Hydrographic Courses accredited to date. Copies of all IHO Publications may be obtained from:-

International Hydrographic Bureau
7, avenue Président J.F. Kennedy,
B.P. 445
MC 98011 Monaco Cedex
Principauté de Monaco

COURSE	CATEGORY	DATE	LANGUAGE
1. Basic and Long Hydrographic Courses at the Royal Naval (UK) Hydrographic School, HMS Drake, Devonport, UK.	A	1980 1983 (reaffirmed)	English
2. L'Ecole Nationale Supérieure des Ingénieurs des Etudes et Techniques d'Armement (ENSIETA) of the "Service hydrographique et océanographique de la Marine" France.	A	1980	French
3. The Royal Australian Navy's Course for 4th Class Hydrographic Surveyor, Sydney, Australia.	B	1981	English
4. Basic/ Long Hydrographic Specialist Course of the Indian Naval Hydrographic School, Goa, India.	A	1982	English
5. 4-Year Course Programme of "Hogere Zeevaartschool", Amsterdam, Netherlands.	A	1982	Dutch
6. Course Submission of "l'Ecole des Hydrographes" of the "Service hydrographique et océanographique de la Marine", France.	B	1983	French
7. Specialization Course in Hydrography of the Portuguese Naval Hydrographic Institute, Lisboa, Portugal.	A	1983	Portuguese
8. Graduate Education Programme in Hydrographic Surveying of the US Naval Post Graduate School, Monterey, USA.	A	1984	English
9. Syllabus of the Final Examination in Hydrographic Surveying of the Royal Institution of Chartered Surveyors (RICS) U.K.	A	1984	English
10. Intermediate Hydrography and Oceanography Course of the Hydrographic Institute of Portugal, Lisboa, Portugal.	B	1984	Portuguese

11.	Specialization Course in Hydrography of the Spanish Hydrographic Institute, Cadiz, Spain.	A	1985	Spanish
12.	Specialization Course in Hydrography of the Italian Hydrographic Institute, Genoa, Italy.	A	1986	Italian
13.	Graduate Diploma Course of the Australian Maritime College, Tasmania.	A Academic	1986	English
14.	Hydrographic Course of the Japanese Maritime Safety School, Japan.	B	1987	Japanese
15.	Hydrographic Specialist Programme of the Canadian Hydrographic Service. Canada.	A	1987	English
16.	Hydrographic Surveyor Training Programme of the University of New Brunswick, Canada.	A Academic	1987	English
17.	Diploma in Hydrographic Surveying of the Plymouth Polytechnic, U.K.	A Academic	1987	English
18.	Group Training Course in Hydrographic Survey, Japan.	B	1988	English
19.	Advanced Course in Hydrography of the Maritime Safety Academy, Japan.	A	1989	Japanese
20.	Hydrographic Training Programme of the U.S.Naval Oceanographic Office, USA.	B Academic	1989	English
21.	Port Hydrography Course of Bordeaux University, France.	B Academic	1989	French
22.	Specialization Course in Hydrography of the Chilean Hydrographic Institute, Valparaiso, Chile.	B	1990	Spanish
23.	Course in Hydrography of the Hamburg Polytechnic, Hamburg, FRG.	A Academic	1990	German

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Item 8 (d) of the provisional agenda*

MANAGEMENT OF NATIONAL MAPPING AND CHARTING PROGRAMMES: GEOGRAPHICAL NAMES

Standardization of undersea feature names

Paper submitted by the International Hydrographic Organization

* E/CONF.83/1.

90-37066 2053g (E)

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1. In recent years, considerable concern has been expressed at the indiscriminate and unregulated naming of undersea features which often get into print, in articles submitted to professional journals or on ocean maps and charts, without any close scrutiny having been made concerning their suitability, or whether the feature has already been discovered and named.

2. In order to remedy this situation and to bring the geographical names of undersea features to a better standardization, an IHO publication called "Standardization of Undersea Feature Names" and containing Guidelines, a Name Proposal Form and a List of Terms and Definitions, has been worked out through collaboration between the "GEBCO Sub-Committee on Geographical Names and Nomenclature of Ocean Bottom Features" (appointed in 1974 by the "Joint IOC/IHO Guiding Committee for GEBCO") and the Working Group on Maritime and Undersea Features of the "United Nations Group of Experts on Geographical Names (UNGEGN)", in accordance with the provisions of appropriate resolutions of UN Conferences on Geographical Names.

3. The 1st edition of this joint IOC/IHO publication, numbered BP-0006, was published in 1981, and the 2nd one in 1989. Versions are available in English/French (Edition 1989), English/Spanish (Edition 1985) and English/Russian (Edition 1983). New editions of the last two are planned in 1991. In addition, arrangements have been made for English/Chinese, English/German and English/Japanese versions, now in preparation.

4. At the request of the "Joint IOC/IHO Guiding Committee for GEBCO", in order to obtain the largest distribution of these Guidelines and to bring the Geographical Names of Undersea Features to a better Standardization, the BP-0006 is available gratis from the IHB and IOC.

5. This publication essentially contains a list of definitions or "generic terms" to reflect physiographic description of Undersea features, which are defined as parts of the ocean floor or seabed that have measurable relief or are delimitated by relief. An example is:

"CANYON
A relatively narrow, deep depression with steeps sides, the bottom of which generally has a continuous slope, developed characteristically on some continental slopes.

e.g. Hudson Canyon
Ref : SHEPARD, F.P. and DILL, R.F., 1966, Submarine Canyons and other Sea Valleys, Rand Mc Nally and Co., Chicago, 381 pp."

6. As for naming features, the principal concern is to provide effective, conveniently usable and appropriate reference. The sphere of activity is limited to those features entirely or more than 50% outside waters under the jurisdiction of States. Accordingly, individuals and agencies wishing to apply names to unnamed features in international waters should adhere to internationally accepted principles and procedures, as described in the BP-0006. They are invited to submit their proposals to the IHB or to the IOC, for consideration by the IOC/IHO GEBCO Sub-Committee on Geographical Names and Nomenclature of Ocean Bottom Features (SCGN); this will advise on any potentially confusing duplication of names. An "Undersea Feature Name Proposal" form as included in the above publication should be used. Proposal forms in English, French, Arabic, Greek, Italian, Portuguese and Spanish versions are available from the IHB. Versions in other languages are being prepared.

7. In other respects, as recommended by the 1987 International Hydrographic Conference, publishers of ocean maps and editors of scientific journals, are invited to require compilers and authors in their country to provide written evidence of proposed new names, before accepting for publication any maps or scientific articles containing these names.

8. During a Session of the "Joint IOC/IHO Guiding Committee for GEBCO" in 1983, the IHB was requested to prepare a Gazetteer of the Geographical Names of Undersea Features shown on the GEBCO sheets and on the IHO small-scale international chart series, so that they could be used on other chart series and in order to standardize these names.

9. The IHB accepted the task, particularly since the small-scale INT charts, produced by IHO Member States, were increasingly showing more detailed ocean morphology with more geographical names. After several drafts of the Gazetteer had been prepared and then considered by the GEBCO SCGN, the 1st Edition was eventually approved in 1988 by the "GEBCO Officers", and was published by the IHB in the same year, as BP-0008.

10. In this Gazetteer,

- the geographical names are given in alphabetical order in the English language;
- the generic terms used to define the nature of each undersea feature are those which appear in the BP-0006 "Standardization of Undersea Feature Names";
- the geographical positions - latitude and longitude - given for each geographical name, and consisting of 1 or 2 points depending on the extent of the feature, are approximate and must be used only to identify the undersea feature on the referenced chart(s).

11. This Gazetteer has been published solely for standardization purposes on nautical and bathymetric charts, and must not be construed as having any legal or political connotation whatsoever. The 1st Edition of BP-0008 "Gazetteer of Geographical Names of Undersea Features" contains 1400 names and is available for purchase from the IHB. A new edition will be published in 1991.

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Item 9 of the provisional agenda*

TECHNICAL ASSISTANCE AND TRANSFER OF TECHNOLOGY

Hydrographic technical assistance

Paper submitted by the International Hydrographic Bureau

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* E/CONF.83/1.

90-37073 2206d (E)

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INTRODUCTION

1. The International Hydrographic Organization attaches great importance to the provision of technical assistance and advice to developing countries in order to facilitate setting up or expanding their hydrographic services. These have become increasingly important for the socio-economic development of all the coastal states, particularly after the adoption of the new United Nations Convention on the Law of the Sea-1982. An IHO Paper entitled "Status of Hydrographic Surveying and Nautical Charting in Asia and Pacific", being presented at this Conference, highlights the need and importance of hydrography and summarises the present status of hydrography and nautical charting within 52 coastal states in Asia and the Pacific. The report points out serious deficiencies in many of the states, which must adopt immediate measures to improve their hydrographic and nautical charting status by allocating national resources and obtaining external assistance as a matter of priority. In order to avoid repetition of what is stated in that paper, it should suffice to emphasise that nautical charts for maritime developments in Asia and the Pacific must be considered in the same way that maps provide an essential basis for planning roads, railways and general urban and rural development in the hinterland.

2. It is hard to quantify the potential economic benefits of hydrographic and nautical charting projects and the problem is compounded in many developing countries, which lack the requisite local expertise. It is therefore incumbent on IHO and the concerned UN agencies to advise the concerned Governmental agencies of the developing countries that hydrographic projects should be given at least equal priority as those with more obvious benefits; a lack of modern hydrographic data and updated nautical charts will inevitably seriously impair their nation's economies, should they rely, as most countries do, on the efficient export and import of goods and if they are to benefit fully from the potential available within their large Exclusive Economic Zones; in the case of many of the island states in the Pacific, these far exceed their land areas.

TECHNICAL ASSISTANCE PROGRAMME OF THE IHO

3. The Member States of the IHO fully appreciated the problems and formidable challenges faced by all the developing countries around the world to develop viable National Hydrographic Services and accordingly approved the expansion of the technical assistance and advisory role of the Organization in 1982 by allocating funds to enable visits to be made by

IHB experts to any country - whether an IHO Member State or not - which requests such visits, at no expense to the developing country. On receipt of such a request at the IHB, the Directing Committee of the IHB arranges for one of its senior professional staff to visit the country with a view to:

a. Visiting all the various national organizations with marine responsibilities to discuss the present status of nautical charting and hydrographic services and the need for improvements.

b. Explaining to all those senior officials with responsibility for marine activities the need for national cooperation, usually by the formation of a National Hydrographic Committee.

c. Making a preliminary report including:

(i) A short description of the country, noting areas where marine activities have a potential for improving the national economy and outlining areas of marine activities which require hydrographic data, charts and other services.

(ii) An assessment of the present situation concerning charts and hydrographic services, including the facilities already available such as manpower, equipment, vessels etc.

(iii) A description of the negative effects on the national economy resulting from the present situation and the benefits to be derived from improving the hydrographic facilities.

(iv) A preliminary programme for collection of hydrographic data and production of charts, with suggested priority of the areas to be surveyed.

(v) A preliminary recommendation of the most suitable hydrographic organisation, including minimum level of personnel, equipment and vessels, maintenance facilities and training programme required.

(vi) Recommendations for national cooperation - including the early formation of a National Hydrographic Committee, if appropriate.

d. Visiting the national Financial Authority and UNDP Resident Representative to discuss financial or technical aid from UNDP or donor countries and other aid-giving agencies.

e. Investigating which donor countries have been, or are still, giving aid to the country and whether there are any current or proposed bilateral agreements on similar projects.

4. On return to the IHB, the expert produces a report of his visit, which is reviewed by the Directing Committee of the IHB and forwarded to the concerned Government authority of the country visited. The Government is

advised to initiate the following actions, should it decide to follow up the recommendations of the report, particularly in respect of obtaining UNDP assistance:

a. Enact legislation concerning the creation of a National Hydrographic Service; emphasising that UNDP, donor countries and other aid-giving agencies cannot consider hydrographic projects until the formation of a national hydrographic service has, at least, been approved by the Government.

b. Take necessary steps, in consultation with the UNDP Resident Representative, to include the project in the Country Programme Cycle.

c. Prepare a Project Formulation Framework (PFF), with the assistance and guidance of the UNDP Resident Representative and the IHB.

d. Subject to agreement with the UNDP on the PFF, prepare a Draft UNDP Project Document, in consultation with the IHB.

TECHNICAL ASSISTANCE VISITS UNDERTAKEN BY THE IHB STAFF

5. Following the above policy guidelines for technical assistance, the IHB has responded to requests from several developing countries and has arranged visits during the past few years to Papua New Guinea (1983), Kingdom of Tonga (1990) and Fiji (1990) in the Pacific and Pakistan (1990) in Asia.

(a) The Kingdom of Tonga had accepted the need to establish a hydrographic service in order to replace the old and obsolete charts of its vast EEZ and coastal areas with charts based on modern hydrographic data, as required by its several national agencies such as port authority, fisheries, natural resources, defence etc. It is understood that, following the visit by an IHB expert and receipt of the visit report, a National Hydrographic Service and National Hydrographic Committee have now been established and that a survey vessel is expected to be delivered by Australia in May 1991 under the Australian Assistance Programme. However, the Kingdom still urgently needs external financial assistance to continue to maintain the services of a hydrographic technical advisor (at present funded by New Zealand on an ad hoc basis) and to procure some essential survey equipments.

(b) The Fijian Government was provided with a survey vessel by the Australian Government in 1987 and a survey launch by the British Government in June 1990, but the Fijian National Hydrograpic Service still needs some additional external financial assistance to replace old survey equipments, such as electronic position fixing system and echo sounders to take full advantage of these expensive and excellent existing facilities. Following a short visit by an IHB expert in March 1990, the Fijian Government is actively considering the establishment of a National Hydrographic

Committee, which will have representatives from all the national agencies interested in the hydrographic data.

(c) Pakistan needs some essential survey equipment to enhance and strengthen its School of Hydrography and a dedicated survey vessel to progress hydrographic surveys of its coastal waters and newly acquired large EEZ.

(d) Papua New Guinea has been progressing the hydrographic surveys of its waters with the assistance of Australian Government under a bilateral agreement. The Government has however been advised to initiate efforts aimed at achieving greater self reliance, in accordance with the recommendations of the earlier report of the visit by an IHB expert in 1983.

6. In addition to the above visits, which were specifically directed towards technical assistance missions, several Asian and Pacific Region countries were visited by the President of the IHB between 1988 and 1990 to discuss status of nautical charting and hydrography with the Hydrographers and other concerned Government officials. These included Australia, Bahrain, China, Democratic Peoples Republic of Korea, Hong Kong, Indonesia, Japan, Republic of Korea, Malaysia, Myanmar, New Zealand, Papua New Guinea, Thailand and Singapore.

TECHNICAL ASSISTANCE COORDINATION COMMITTEE (TACC)

7. The IHO is concerned that, in many developing countries, particularly those without a National Hydrographic Service, uncoordinated and independent approaches are often being made by different national Departments interested in the development of hydrographic capabilities, to different UN or other organisations for advice - IMO, IOC, FAO etc. In some cases, approaches are also being made to non-government or private sector companies. The IHO has therefore formed a TACC in 1989, with the International Federation of Surveyors (FIG), representing the private sector. The Terms of Reference of this committee are:-

a. To establish and maintain a full, complete and up-to-date inventory of all hydrographic surveying and nautical charting projects involving technical assistance to developing countries; this includes assistance in the way of academic and on-the-job training of surveyors, nautical cartographers and maintenance staff, provision of expert advice, provision or loan of equipment and includes projects under consideration, in hand or recently completed. To distribute such data in a timely fashion to all known interested parties - including international and national organisations and funding agencies, as well as to those in the private sector.

b. To establish procedures for the coordination of information about all expert advice and other technical assistance projects involving hydrography and nautical charting to any developing coastal State and for the monitoring of all such projects, so as to ensure the maximum benefit from them and to avoid wasted

expense and effort by donor countries and/or funding agencies.

c. To review the status of hydrographic surveying and nautical charting in developing coastal States, on an annual basis. To review the standards of accuracy, validity of data available and to consider the interaction of such standards and validity between coastal, offshore and harbour areas and between differing requirements of safety of navigation, dredging, port and coastal development, offshore exploration and exploitation and environmental protection. To make this information available to donor organisations to help them to decide where their assistance could be of most benefit and best utilised.

d. To promote the perception of the importance of hydrography and of modern, updated charts to all coastal States at every opportunity and to encourage the provision of financial assistance to hydrographic projects by establishing close relationships with international organizations, such as IMO, IOC, FAO, UN and with international and national funding agencies.

8. It is felt that this Committee could make a significant contribution towards the coordination of national hydrographic activities and help to prevent independent and parallel approaches by different national Departments of developing coastal States which could compete for technical assitance. It could facilitate efficient and effective utilisation of the limited financial resources through the most appropriate national organisation, provided the membership of TACC includes representatives of all the concerned international agencies involved with the technical assistance and advice. At present, TACC consists of five Members appointed by FIG and five appointed by the IHO, but it is proposed to expand this Committee by including UN and other agencies. The Committee works by correspondence and takes advantage of international conferences, etc., at which formal meetings are also organised from time to time. The IHB provides the secretarial and administrative support needed to gather/hold/disseminate data on behalf of the Joint Committe. The IHB has started to issue periodical reports on all projects and advisory visits of which it has been informed.

REGIONAL TRAINING AND MAINTENANCE CENTERS

9. The IHO is well aware of the problems of the maintenance of survey equipment and the training of hydrographic personnel being faced by many developing countries which are remote from the manufacturers of modern hydrographic equipment and well-established training institutions. It is very expensive for these countries to organise such maintenance and training facilities on a national level, particularly for relatively modest requirements. The IHO feels strongly that there are good grounds for establishing Regional Centres for training and maintenance. The IHO is presently coordinating with the Economic Commission for Africa (ECA) to plan and establish up to three such Centres in Africa and a proposal has already been drafted and presented by the IHO to ECA regarding the expansion of the existing Regional Centre for Services in Surveying Mapping and Remote Sensing (RCSSMRS) at Nairobi, Kenya to include the maintenance

and training facilities for hydrographic surveying and nautical charting and the appointment of a regional Hydrographic Adviser. As far as Asia and the Pacific are concerned, some training facilities are already available; these will be discussed under Agenda Item 8 (a). There may be a need for more such training facilities and it may also be very useful for Asia and the Pacific to consider the establishment of at least one Regional Centre in each region, each with the capability to service and maintain equipment - such as echo sounders, sidescan sonars, tide gauges and electronic position fixing systems etc.

COOPERATION WITH THE UNITED NATIONS AGENCIES

10. The IHO has maintained a very close cooperation with various concerned United Nations Agencies and is planning to further strengthen and broaden this very fruitful relationship through additions to the existing Memorandums of Understanding with IOC and IMO so as to include technical assistance and cooperation in respect of hydrographic projects of all the developing countries, including Asia and the Pacific. The IHO also continues its active cooperation with the Department of Technical Cooperation for Development of the UN Secretariat as evidenced by the presentation of an updated report entitled "Status of Hydrographic Surveying and Nautical Charting Worldwide", at the Fourth United Nations Regional Cartographic Conference for the Americas, 23 to 27 January 1989.

11. The IHB's Technical Staff Members visiting various countries for technical assistance missions, always arrange to visit UNDP Resident Representatives to discuss the status of hydrography and nautical charting of the country visited, its future requirements and the financial implications of the development of urgently needed hydrographic infra-structure and equipments. These meetings with the UNDP Representatives have been mutually rewarding and beneficial in appreciating the importance of hydrography and nautical charting for the socio-economic development of the coastal states and in understanding the complexity of the procedures to be followed by the countries to obtain UNDP assistance for Hydrographic Projects. Based on the experience gained during such discussions and the positive contributions made by the UNDP Resident Representatives and the UNDP Headquarters in New York, the IHO has recently updated its Guidelines relating to technical assistance by including details of the procedures to be followed when applying for UNDP assistance as promulgated in IHO's Information Paper No. 6 entitled "Hydrographic Technical Assistance to Developing Countries", part of which has been reproduced in this Paper.